

## REMARKS

Claims 1-14 are pending in this application and are rejected. In response, Applicants amend independent claims 1, 7, and 14. No new matter is introduced by the amended claim, which are fully supported by the specification. In view of the following remarks, Applicants respectfully request reconsideration of the application and issuance of a Notice of Allowance.

### Previous Correspondence

In paragraph 1, the Examiner acknowledged the amendment of the claims and withdrew the 35 U.S.C. § 112 rejections from the Office Action mailed on March 26, 2002. Further, in paragraph 9, the Examiner stated that claims 3 and 4 are allowable if rewritten to overcome the rejections under 35 U.S.C. § 112, first and second paragraph, and include all the limitations of the base claim and intervening claims. Applicants thank the Examiner and consequently address the new issues raised by the Examiner.

### Rejection under 35 U.S.C. § 112, First Paragraph

In paragraph 3, the Examiner rejected claims 1-14 under 35 U.S.C. § 112, first paragraph. Specifically, the Examiner stated that independent claims 1, 7, and 14, on lines 6, 5, and 4, respectively, recite rotating the received signal. Further, the Examiner stated, “the specification does not disclose of ‘rotating’ any received signal” and subsequently also rejected claims

2-6 and 8-13 because they depend on rejected independent claims 1, 7, and 14.

Applicants respectfully point out page 9, lines 11-12 in the specification, which states, "...after received data signal is shifted to left output channel, such data is routed back to applicable barrel shifter so that different channel may use the stored data." The text clearly describes a rotation operation.

Further, barrel shifters inherently shift and rotate data to the left or right. Specifically, Applicants submit "CIS 273: Computer Organization & Design – Spring 2002, Laboratory #10 – Design of a 4-bit Barrel Shifter," at <http://www.cis.umassd.edu/~amathuria/273/lab10/s02-273-lab10.html>, last visited on November 19, 2002. In the second paragraph under the introduction, the author states, "...a barrel shifter, [is] a combinational circuit that shifts or rotates the input data..." Thus, it is known in the art that barrel shifters inherently rotate data.

Therefore, Applicants respectfully request the withdrawal of the rejection and reconsideration of independent claims 1, 7, and 14. Since independent claims 1, 7, and 14 are allowable, dependent claims 2-6 and 8-13 are allowable for the same reason.

#### Rejection under 35 U.S.C. § 112, Second Paragraph

In paragraph 4, the Examiner rejected claims 1-14 under 35 U.S.C. § 112, second paragraph for indefiniteness. Specifically, the Examiner stated that independent claims 1, 7, and 14, on lines 6, 5, and 4, respectively, recite

rotating the received signal and the Examiner "is unclear what is meant by rotating." Further the Examiner rejected claims 2-6 and 8-13 because they depend on rejected claims.

For the same reasons as above, Applicants respectfully submit that the rotation operation described in the specification on page 9, lines 11-12 and the inherent rotation operation of barrel shifters as described by the reference overcome the rejection of independent claims 1, 7, and 14.

The Examiner also rejected claim 3 because, as stated in the rejection, "...it is unclear how simultaneous switching could occur if the apparatus consisted only of one multiplexer and one barrel-shift register." Applicants respectfully direct the Examiner to page 6, lines 18-21 of the specification, which describes simultaneous switching between endpoints. Further, claim 3 recites, "...switching simultaneously between the at least one input endpoint and the at least one output endpoint." Therefore, the simultaneous switching operation occurs between endpoints, not between the multiplexer and barrel shift register.

Lastly, the Examiner rejected claim 4 because, as stated in the rejection, "...it is unclear what element of the apparatus performs this function [of converting a received data signal from parallel to serial form]." Applicants respectfully direct the Examiner to FIG. 2B in the specification, which shows two serial to parallel converters. The arrows to and from the converters show the flow of data in opposite directions. Therefore, one converter converts data

from serial to parallel, while the other converter converts data from parallel to serial. Therefore, these converters perform the conversion.

Applicants respectfully request the withdrawal of the rejection. Since independent claims 1, 7, and 14 are allowable, dependent claims 2-6 and 8-13 are allowable for the same reason.

#### Rejections under 35 U.S.C. § 102(b)

In paragraph 5, the Examiner rejected claims 1, 7, 9, and 11-14 under 35 U.S.C. § 102(b) as being anticipated by Machida, U.S. Patent No. 4,665,538. Applicants respectfully traverse.

Applicants amend independent claims 1, 7, and 14 to recite pairs of barrel shift registers. Further, in the specification on page 7, line 5, “[I]nputs are connected to two loadable barrel shifter modules.” Also in the specification on page 7, lines 11-13, the pair of barrel shift modules is defined as left and right barrel shifter modules that separate the incoming data.

Machida does not teach the use of pairs of barrel shift registers. Specifically, Machida discloses a barrel shift matrix that does not teach using pairs of barrel shift register to separate “left” and “right” incoming data. Therefore, Machida does not disclose an electronic switching apparatus as recited in independent claims 1, 7, and 14. Thus, Machida cannot anticipate independent claims 1, 7, and 14.

Applicants respectfully request the withdrawal of the rejection under 35 U.S.C. § 102(b). Dependent claims 2-6 and 12-13 depend either directly or

indirectly from independent claim 1. Similarly, dependent claims 8-11 depend directly from claim 7. Since independent claims 1 and 7 are allowable, the dependent claims are allowable for the same reason.

Rejections under 35 U.S.C. § 103(a)

In paragraph 6, the Examiner rejected claims 1, 2, 5, and 6 under 35 U.S.C. § 103(a) as being unpatentable over Phelps et al. Applicants respectfully traverse.

As amended, independent claim 1 recites a pair of barrel shift registers. In contrast, Phelps et al. discloses in col. 4, line 8, “four [barrel shifters] per set.” Further, Phelps et al. teaches in col. 4. lines 16-24 that the four barrel shifters per set are coupled together to form four output terminals. Therefore, Phelps et al. teaches away from Applicants’ independent claim reciting a pair of barrel shifters to separate “left” and “right” signals. Since Phelps et al. does not teach one of ordinary skill in the art what the Examiner opines it teaches, independent claim 1 and dependent claims 2, 5, and 6 are allowable.

Further, in paragraph 7, the Examiner rejected claim 8 under 35 U.S.C. § 103(a) as being unpatentable over Machida in view of Phelps et al. Applicants respectfully traverse.

Since Machida and Phelps et al. do not disclose a pair of barrel shifters and further, teach away from using a pair of barrel shifters to separate data into “left” and “right” barrel shifters, dependent claim 8 is allowable.

Lastly, in paragraph 8, the Examiner rejected claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Machida.

Since Machida does not anticipate independent claim 7, Machida cannot teach one of ordinary skill in the art to use a pair of barrel shifters to separate data into “left” and “right” barrel shifters. Since dependent claim 10 depends from allowable independent claim 7, dependent claim 10 is allowable for the same reason.

Because independent claims 1 and 7 are not obvious under Machida or Phelps et al., individually and in combination, dependent claims 2, 5, 6, 8, and 10 are not obvious. Applicants respectfully request the withdrawal of the rejection under 35 U.S.C. § 103(a).

Conclusion

Based on the above remarks, the Applicants believe that they have fully overcome the rejections in the Final Office Action mailed on September 20, 2002 and that the application is in condition for allowance. If the Examiner has questions regarding the case, the Examiner is invited to contact the Applicants' undersigned representative at the number given below.

Respectfully submitted,

Seng-Khoon Tng et al.

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By: 

Susan Yee, Reg. No. 41,388  
Carr & Ferrell, LLP  
2225 E. Bayshore Road, Suite 200  
Palo Alto, CA 94303  
Tel: (650) 812-3423  
Fax: (650) 812-3444

Version with markings to show changes made

In the Claims:

- 1 1. (Twice amended) An electronic switching apparatus for flexibly
- 2 interconnecting a plurality of signal endpoints, the apparatus comprising:
- 3       a first circuit for receiving at least one input signal from at least one
- 4 input endpoint, the first circuit having at least one pair of left and right barrel
- 5 shift registers coupled to at least one of the at least one input endpoint for
- 6 receiving the at least one input signal, shifting and rotating the at least one
- 7 input signal, and transmitting at least one output signal; and
- 8       a second circuit coupled to outputs from the first circuit for sending at
- 9 least one received signal to at least one output endpoint.

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1 7. (Twice amended) A method for electronic signal coupling, the method  
2 comprising the steps of:  
3 receiving a first set of digital signals, the received first set of digital  
4 signals being provided to [a plurality of] at least one pair of left and right barrel  
5 shift registers;  
6 shifting and rotating the first set of digital signals; and  
7 transmitting a second set of digital signals, the transmitted second set of  
8 digital signals being provided from a plurality of multiplexers, the plurality of  
9 multiplexers being selectably coupled to the barrel shift registers such that at  
10 least one signal selected in the first set of digital signals is selectably coupled  
11 for transmission in the second set of digital signals.

1 14. (Once amended) A system for electronic signal coupling comprising:  
2 means for receiving a first set of digital signals, the received first set of  
3 digital signals being provided to [a plurality of] at least one pair of left and right  
4 barrel shift registers;  
5 means for shifting and rotating the first set of digital signals; and  
6 means for transmitting a second set of digital signals, the transmitted  
7 second set of digital signals being provided from a plurality of multiplexers, the  
8 plurality of multiplexers being selectably coupled to the barrel shift registers  
9 such that at least one signal selected in the first set of digital signals is  
10 selectably coupled for transmission in the second set of digital signals.